PROCEEDINGS

OF

THE ROYAL SOCIETY.

1837—1838. No. 31.

December 7, 1837.

FRANCIS BAILY, Esq., Vice-President and Treasurer, in the Chair.

No paper was read.

December 14, 1837.

JOHN GEORGE CHILDREN, Esq., Vice-President, in the Chair.

The reading of a paper, entitled "On low Fogs and stationary Clouds." By William Kelly, M.D. Communicated by Captain Beaufort, R.N., F.R.S., &c., was resumed and concluded.

The object of the present paper is to point out the circumstances which influence the formation of low fogs, and to show what analogy exists between the causes that produce them and those that occasion certain forms of clouds, which may be considered as differing from fogs only in position. Having been attached for several years to the naval party employed in the survey of the gulf and river of St. Lawrence, the author had ample opportunities of observing the phenomena in question. He concludes that the fogs described occur chiefly when the air is nearly saturated with moisture, and when at the same time the temperature of the water on which they rest either exceeds that of the air, or is considerably below it. These fogs are generally very dense, often limiting the sphere of vision to a few fathoms; but seldom extend to any considerable height. They do not often cover the land to any distance from the shore; and the tops of the hills, close to the water's edge, are clear, while the bases, or sides, are enveloped in the mist.

The following papers were then read:—

"On the Colours of Mixed Plates." By Sir David Brewster, K.G.H., F.R.S., &c.

In the prosecution of his optical inquiries, the author was induced to study the phenomena of mixed plates, (originally discovered by Dr. Young, and described by him in the Philosophical Transactions for 1802,) as he had observed similar appearances in various mineral bodies under analogous circumstances, to which he had been led to

ascribe an origin different from that assigned by Dr. Young. In order to obtain a more distinct view of these colours, Sir David Brewster employed, instead of the substances used by Dr. Young, the white of an egg, beat up into froth, and pressed into a thin film between plates of glass. From observations of the colours exhibited by plates so prepared, and also by the edge of a thin film of nacrite in contact with copaivi balsam, the author deduces the conclusion, that all these phenomena, as well as those often seen in certain specimens of mica through which titanium is disseminated, and also in sulphate of lime, are cases of diffraction, where the light is obstructed by the edges of very thin transparent plates placed in a medium of different refractive power. If the plate were opake, the fringes produced would be of the same kind as those often noticed, and which are explained on the principle of interference; but, owing to the transparency of the plate, fringes are produced within its shadow; and, owing to the thinness of the plate, the light transmitted through it is retarded, and, interfering with the partial waves which pass through the plate, and with those which pass beyond the diffracting edge with undiminished velocity, modify the usual system of fringes in the manner described by the author in the present paper.

"Of such Ellipsoids, consisting of homogeneous Matter, as are capable of having the Resultant of the Attraction of the Mass upon a Particle in the Surface, and a Centrifugal Force caused by revolving about one of the Axes, made perpendicular to the Surface." By James Ivory, K.H., M.A., F.R.S. L. and Ed., Inst. Reg. Sc., Paris, Corresp. et Reg. Sc. Gotting. Corresp.

Lagrange, who has considered the problem of the attractions of homogeneous ellipsoids in all its generality, and has given the true equations from which its solution must be derived, inferred from them that a homogeneous planet cannot be in equilibrium unless it has a figure of revolution. But M. Jacobi has proved that an equilibrium is possible in some ellipsoids of which the three axes are unequal and have a certain relation to one another. His transcendental equations, however, although adapted to numerical computation on particular suppositions, still leave the most interesting points of the problem unexplored.

The author of the present paper points out the following property as being characteristic of all spheroids with which an equilibrium is possible on the supposition of a centrifugal force. From any point in the surface of the ellipsoid draw a perpendicular to the least axis, and likewise a line at right angles to the surface: if the plane passing through these two lines contain the resultant of the attractions of all the particles of the spheroid upon the point in the surface, the equilibrium will be possible, otherwise it will not. For the resultant of the centrifugal force and the attraction of the mass must be a force perpendicular to the surface of the ellipsoid, which requires that the directions of the three forces shall be contained in